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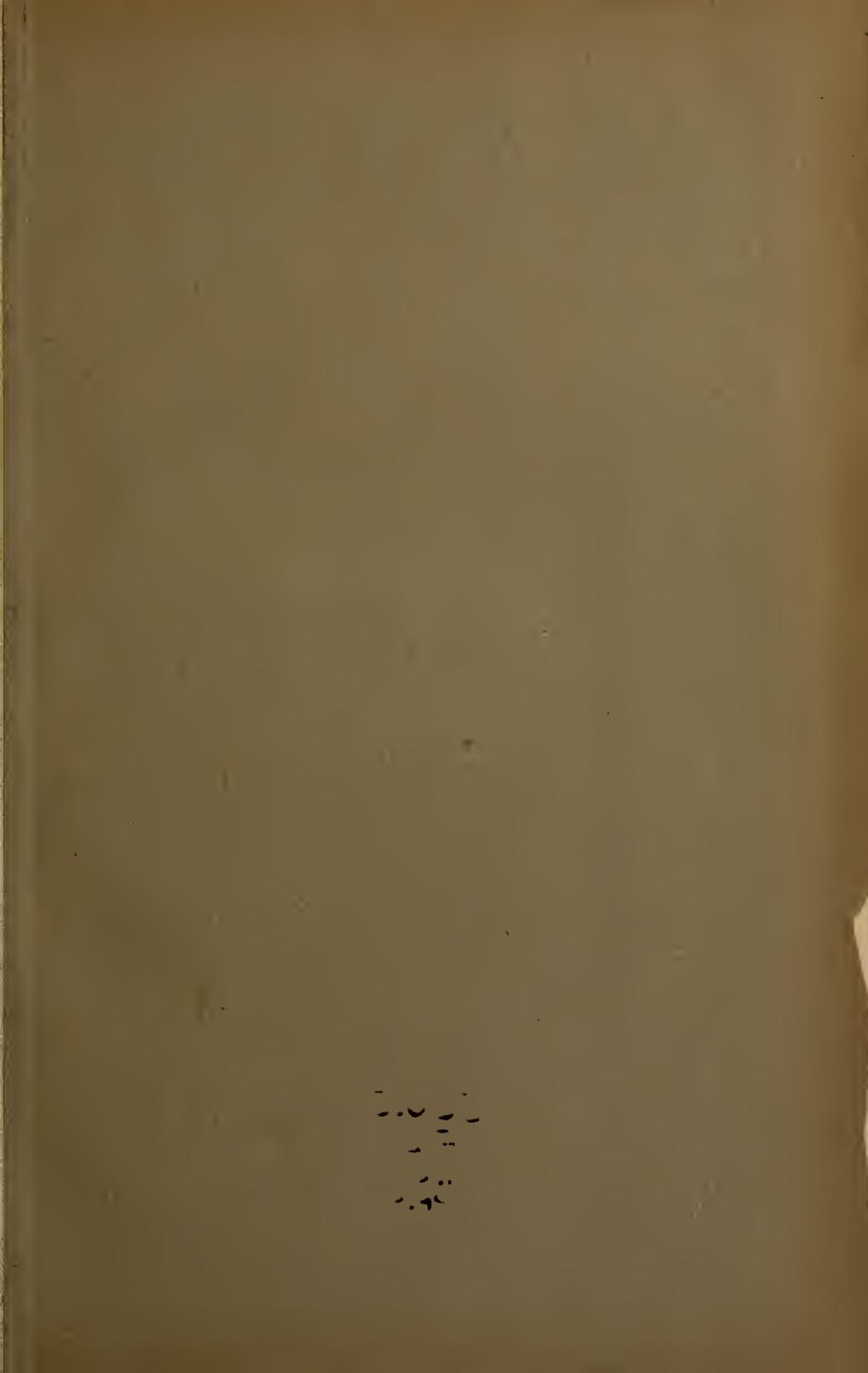
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A LIST OF MAMMALS

COLLECTED BY

EDMUND HELLER,

IN

THE SAN PEDRO MARTIR AND
HANSON LAGUNA MOUNTAINS

AND THE

ACCOMPANYING COAST REGIONS OF
LOWER CALIFORNIA

WITH DESCRIPTIONS OF APPARENTLY NEW SPECIES.

BY

D. G. ELLIOT, F. R. S. E., ETC.
Curator of the Department.



CHICAGO, U. S. A.

June, 1903.

A LIST
OF MAMMALS COLLECTED BY EDMUND HELLER,
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BY D. G. ELLIOT, F.R.S.E., ETC.

In February, 1902, Mr. Heller arrived at the port of Ensenada on Todos Santos Bay, Lower California, with the intention of making this place his starting-point for an exploration and collecting expedition into the mountain ranges of Hanson Laguna, and San Pedro Martir. A guide was here procured and a pack-train of burros, for the opportunities to obtain any supplies after leaving the coast were practically *nil*, and everything needed had to be carried on donkey back. An existing law compelling all who brought guns into Lower California to return to the port of entry every sixty days and have their permits to bear arms renewed, made it necessary that his first trip should not exceed two months, and Mr. Heller decided to go to San Felipe on the Gulf of California through the cañon of the Salado River, San Pedro Martir Mountains, returning to Ensenada by the same route. As this lofty range is but little known, and never before has been systematically explored by any collector, a comparatively small number of animals having been previously obtained from a few localities only, Mr. Heller's description of these mountains contains valuable information. He writes:

"The name San Pedro Martir is applied to an elevated plateau region extending from $30^{\circ} 30'$ to $31^{\circ} 10'$ North latitude, and with a width of from fifteen to twenty miles. The general trend of the plateau is north and south, and it is traversed by low rocky ridges having the same direction, and the plateau varies from six to nine thousand feet and the ridges and peaks rise a few hundred feet higher, the highest peak attaining a height of 10,126 feet, and the slopes of the plateau are precipitous except on the south, where the range gradually merges into the lower hills of that region. The east slope is almost sheer from the summits of the highest peaks to the floor of the desert, and only one almost impassable trail is known on the whole of its extent. The north and west slopes are about equally precipitous and the summit is accessible by but a few rocky trails. The greater part of the drainage of the moun-

tains is to the west into the Pacific, and practically but one of the streams has permanent connection with the ocean.

"The higher parts of the mountains are of granite formation, the ridges and peaks being composed of gigantic boulders produced by weathering. Between these ridges occur level-floored valleys of considerable extent. The southern and northern portions of the mountains are largely composed of a hard, metamorphosed sandstone, and lack the boulder formation so characteristic of the higher and central portions.

"The forests of the plateau region are composed almost wholly of yellow pine, *Pinus jeffreyi*, except on the higher elevations. This tree ranges from 6,000 feet to the highest elevations and is almost everywhere the predominating one. In the lower parts of its range, 6,000 to 7,000 feet, it is restricted to the valleys, the ridges being bare of forest growth, but above these elevations it is confined more to the hillsides and ridges, the valleys being open and grassy. At lesser heights, 4,500 to 6,000 feet, the piñon pine, *P. quadrifolia*, is the only tree and forms forests in some localities. The sugar pine, *P. lambertiana*, occurs sparingly on the higher ridges, from 8,000 feet to the highest summits. The two-leaved pine, *P. murrayana*, forms forests in the northern part at an elevation of about 8,500 feet. A fir, *Abies concolor*, forms a limited portion of the forests from 8,000 feet and above. The incense cedar, *Libocedrus decurrens*, occurs about streams at 7,500 feet and on the hillsides at higher elevations. A few cypress, *Cupressus arizonica*, occur on the highest elevations, but in such limited numbers as to be of slight importance in the composition of the forests. A few oaks, *Quercus chrysolepis* and *Q. grisea*, add to the forest growth at all elevations above 6,000 feet. In the higher elevations, mostly above 8,000 feet, the aspen, *Populus tremuloides*, forms thickets and miniature forests about damp meadows and stream-beds.

"The chaparral clothes the hills and ridges at all elevations, except in localities where the boulders are large and numerous. This growth is made up chiefly of scrub-oaks, several species of *Ceanothus*, chamiso, manzanita, Garrya, and at lower elevations, juniper.

"The greater part of the mountain is in the Transition zone, as shown by the distribution of the yellow pine. This zone approximately extends from 6,000 to 8,500 feet, or perhaps to the summit of the mountains. The presence of the Canadian zone is somewhat doubtful, although the occurrence of *Abies* and *Populus tremuloides* and of *Sciurus d. mearnsi* give a touch of Canadian. The upper Sonoran zone is confined to the region below 6,000 feet and limited to the slopes of the mountains down to 4,000 feet, the whole zone being in a dense chaparral."

"The topography of Ensenada," writes Mr. Heller, "is made up of

ranges of hills and low mountains, the highest elevations being somewhat above 4,000 feet. The formation is chiefly porphyry and sandstone, but the rocks are usually well hidden by the soil and heavy chaparral. This last is made up largely of *Chamiso surnae*, scrub-oak, manzanita, buckeye, *Ceanothus*, etc., which grow very luxuriantly, being almost impenetrable on the northern hillsides and in cañons. On the higher hills a small cypress, and a scrub-pine form thickets. Along the cañons and creeks live-oaks, sycamores, cottonwoods, and willows form scattered groves." Mr. Heller left Ensenada on the 28th of February and proceeded south, near the coast, making his first stop of only a few days duration at San Tomas, about twenty-five miles from Ensenada, where he procured a few additional donkeys, as his impedimenta was too heavy for rapid traveling with the number of animals secured at Ensenada. From San Tomas he entered the Salado River Cañon, in the San Pedro Martir Mountains, and made his first camp about twenty miles west of Trinidad. Of this cañon Mr. Heller says: "It is rather narrow, walled in by mountains, which rise one or two thousand feet above the floor, and the cañon is a white, sandy dry waste, and more or less of a desert in character. Several shrubs, like *Acacia* and *Larea*, are found, together with many desert cacti. The forms which live here have doubtless found their way in over the San Matias Pass through the Trinidad Valley. The altitude of the camp was perhaps 2,000 feet." The next stop was at a small cañon called Las Eucinas, which is about 1,000 feet above the Salado Cañon. The vegetation is somewhat different, the chief tree being the live-oak, *Quercus agrifolia*, and the commonest bush the chamiso." The next camp was "on the western edge of the Trinidad Valley, which is about 500 feet lower than Las Eucinas, and is drained by the Salado River. This side of the valley is in the *Juniperus californicus* belt, which extends westward from here nearly to Las Eucinas. The valley is elliptical, about 15 miles long by 10 in width. On the east and north it is bordered by high hills, but is open to the desert by a wide pass on the southeast, and on the west rises gradually into a broad mesa. In the eastern part of the valley desert plants predominate, such as tree yuccas, creosote, mesquite, cholla and visuaga cacti and many smaller species." One night was passed at a small spring called Aguajito, "on the northern edge of the valley, about four miles northeast. This spring is in the desert vegetation, which is rather luxuriant, and the soil is chiefly white sand." From this camp the train passed on to San Matias spring, the highest elevation reached on this journey. "The spring is situated on the edge of the pass, its altitude being 3,500 to 4,000 feet, on the lower edge of the piñon zone, in a scattered growth of *Pinus parryana*, and the water drains into the desert.

A few feet below the spring the tree yuccas, mescal, and several species of cacti occur abundantly." Two days were passed here on the way to San Felipe and four nights on the return trip. Cañon Esperanza, where two days were passed, was the next stopping-place. It is situated "on the desert slope of the mountains and drains into the San Felipe Valley. The mountains near the cañon's mouth rise almost vertically from the desert to altitudes of 8,000 to 10,000 feet. The floor of the valley is about 1,000 feet above sea level. Near the mouth large granite boulders cover the surface of the ground, but further out nothing but white sand is to be found. Near the base of the mountains the country is very bushy, being covered with a scattered growth of small spreading trees, mostly mesquite, palo verde, ironwood and giant cereus cactus. The whole region is sandy, except the beds of alkali lakes. The only water is that found in the cañons of the San Pedro Martir Mountains and a few tanks in the higher desert ranges. The piñon belt comes down the mountain slopes to within about 1,500 feet of the base. Two days were passed here on our way out and two on our return from San Felipe." This last place, on the Gulf of California, was the next camping-ground. The region about San Felipe Bay is "a level white sand desert, flanked on the west by a rather low range of mountains, and on the north by a similar range extending down to the bay, forming its northern point and separating it from the Colorado Desert farther north. The vegetation about the bay is scanty, the creosote bushes and a few mesquite and copal trees comprising most of it. Cacti are rare in this region." Two weeks were passed and a considerable collection was made. From San Felipe Mr. Heller was obliged to return to Ensenada, as his sixty days would have expired by the time he could reach the Pacific coast, and he therefore retraced his steps, stopping at some of his previous camps. On his arrival he learned that instructions had been forwarded to the authorities from the Secretary of State, Mexico City, at the request of this Institution, to allow him to carry arms, without any time limit being mentioned, anywhere in Mexico he chose to visit. This simplified matters greatly, for it would have been impossible for him to explore the mountains, as he subsequently did, if he had been compelled to return to the coast every sixty days. After various delays from different causes Ensenada was again left on the 7th of May, the intention being to proceed along the western edge of the San Pedro Martir Mountains to their southern border and reach the coast at San Quentin, and then later, during the great heat of summer, to penetrate among the higher peaks of the range. The first camp out from Ensenada was Trinidad, to obtain the burros that had been left there on the return journey from San Felipe, and to procure additional ones. The route was then continued "along the west edge of

the mountains at an average elevation of about 3,000 feet." A short stop was made at San José on the way and a few specimens taken. A stay of six days was made at San Antonio, which "lies at the west base of the range at about 3,000 feet elevation. It is situated on a rushing mountain stream, in a narrow, high-walled valley. The vegetation along the stream is Transitional in character, consisting of live-oaks, sycamores, willows, cottonwoods, etc. The sides of the cañon are Sonoran, the vegetation being chiefly cacti, yuccas, and mesquites. The giant cereus is of rather rare occurrence, and this is apparently its northern limit on the Pacific slope of the peninsula." Rosarito was the next camping-place, where three days were passed. This spot is "about forty miles south of San Antonio and about the same distance due east of San Quentin, situated in a shallow valley near the southwest edge of the San Pedro Martir Mountains, at about 3,500 feet altitude. A small stream rises in the valley and flows down a narrow cañon to the Pacific. The vegetation is mostly Sonoran, various species of cacti, chiefly *Opuntia* and *Cereus*, forming the greatest part of the flora, and mesquite, creosote, yuccas, and mescal the tallest growth. A few desert palms are widely scattered in the cañon bed, which have entered the valley from the east and here reach their northern limit on the coast." From Rosarito a short trip was made across the lower part of the range to Mattoni, on the edge of the desert, the haunts of the mountain sheep, where two weeks were passed mostly in hunting the rare *O. c. nelsoni*, or an animal similar to it. Mattoni is "about forty miles south of Rosarito, and is a wide level valley, walled in by gigantic cliffs, 1,500 to 2,000 feet high, which terminate the broad mesas of the higher country. A shallow cañon, containing pools of water and a heavy growth of palms, extends east through the valley towards the Gulf of California. This region is mostly a lava and granite formation, and is a favorite resort of mountain sheep. Giant cereus cacti, mesquite, creosote, and mescal constitute the greater part of the vegetation. About the summits of the cliffs and mesas a few piñon, pines, *Pinus parryana*, occur." This valley is from 1,500 to 2,000 feet above sea level. North of Mattoni ten days were next passed at Parral, a small valley of a similar formation, and the next camp was made at Rosarito Divide, where he remained two days. This spot was "about twenty miles east of Rosarito, near the main ridge of the mountains, dividing the coast from the Gulf of California at an altitude of about 5,000 feet. The camp was placed on the west slope in a cañon which drains the Rosarito Valley. The vegetation is a mixture of Transition and Sonoran. Here the piñon and the desert palm, the scrub-oaks and the mescal, the ash and the yucca, mingle." Mr. Heller now went to San Quentin on the coast. Of this place he writes: "The region about here

is a low, flat, sandy plain, several miles wide and extending for many miles parallel to the coast. It is flanked by a mesa a hundred feet higher and of about the same appearance and extent, but bounded on the east by low hills, which gradually rise to the higher interior mountains. The region is covered with a fair growth of small bushes and cacti, with a few scattered giant cereus. About the river-beds a few willows and cottonwoods occur, but nowhere else is any vegetation, approximating trees in size, to be found. Near the mouth of the San Simon river a lagoon of fresh water occurs, which is surrounded by a heavy growth of succulent weeds and grasses. This narrow strip of country, bordering the desert, has a cool, damp climate, quite different from that met with a few miles inland." The latter part of July Mr. Heller left San Quentin for the San Pedro Martir Mountains, with the intention of penetrating among the high peaks and exploring the lofty parts of the range. His first camp was at Agua Juncolito, where a stay of but one day was made, and then he proceeded to another spring called Agua Escondido, where he remained four days, and then passed on to Santa Eulalia, at the south end of the mountains, at an elevation of 6,000 feet, and the southern limit of the pine forests. Here he remained two weeks and obtained a considerable number of very desirable specimens. He then went to Santa Rosa, 15 miles north, elevation 7,000 feet, where the pine forests were more extensive and denser. He remained but two days at this camp and then went to La Grulla, "a meadow about the center of the range and near the west base of the highest peaks, at an elevation of about 8,000 feet; pine forests heavy, the largest trees on the mountains." Eleven days were passed in this camp, and he then went to Vallecitos, "a series of small meadows near the north end of the mountains, averaging about 9,000 feet elevation; forest composed of various species of pines; the eastern part bordering the desert slope." Aguaje de las Fresas was the next stopping-place, a spring "in a small cañon on the northern slope, at about 6,000 feet elevation and near the lower limit of the pines." The next camp was made at Piñon, "near the north base of the mountain, at about 5,000 feet altitude, the lower limit of the yellow pine. The final stopping-place in the San Pedro Martir Mountains was made at El Alamo. This place "is situated on the western edge of a large plain, at an elevation of at least 3,500 feet. It is separated from the coast by a considerable range of hills, and from the desert by the Hanson Laguna Mountains. The plain is covered by a scattered growth of juniper, piñon, manzanita, chamiso, mesquite, yucca, etc." In reviewing his journey Mr. Heller writes: "The San Pedro Martir Mountains were thoroughly explored. They were ascended at their southern extremity the first part of August and camps were made at intervals on the ridge to

the extreme north end, where we descended in October. The highest peaks were ascended and both the gulf and coast slopes examined. A good series of deer were obtained and series of all the small mammals taken, but carnivores were rare everywhere, although especial attention was given them." From his last camp at El Alamo Mr. Heller passed northward to the Hanson Laguna range, which is separated from the San Pedro Martir by a gap of considerable extent. A visit to these mountains was desirable in order to determine the northern ranges of the species found to the south. The Hanson Laguna is the southern limit of many forms found in southern California. Mr. Heller's description of this range is as follows: "The range extends north and south without any appreciable culmination into peaks anywhere. Its broad, even character ceases at $31^{\circ} 35'$ north latitude, and the range is continued south of this point by a series of broken peaks, which rise somewhat higher than the northern unbroken portion, but lack the pine forest. To the north of the Hanson Lagoon, which is situated on the summit at about 5,000 feet elevation, among open groves of yellow pine, the range continues its unbroken character as far as the eye could discern, but falls away considerably before reaching the line, the summit near Campo, San Diego County, Cal., being not much over 3,000 feet, and lacking pine forests for almost a score of miles north and south. To the southwest the range merges almost imperceptibly into the Santa Catarina, or Alamo, plain, and slightly more abruptly to the east and north into the Real del Castillo Valley. The entire eastern slope is an abrupt descent to the Colorado Desert. This slope is everywhere of a bold rugged granite formation. The crest of the range is considerably nearer the gulf coast or Colorado River than the Pacific, but the drainage is chiefly toward the west. The summit is entirely of a granite formation, and a considerable part of it is covered by huge boulders of decomposition similar to the San Pedro Martir range.

"The mountains are covered from 4,000 ft. to the summit by a continuous forest growth of yellow pine, *Pinus jeffreyi*. Scattered among these groves are a few big cone pine, *P. coulteri*, and incense cedar, *Tibocedrus decurrens*. Below the pines on both slopes a scattered growth of piñon pines, *P. quadrifolia*, occur, and on the desert slope below 4,500 ft. another piñon, *P. monophylla*, forms a heavy growth. The oaks, *Quercus chryssolepis*, *Q. wislizeni*, and *Q. californicus*, form a considerable part of the forest at all altitudes above 4,000 ft. The chaparral consists of scrub-oaks, several species of *Ceanothus*, chamiso, manzanita, *Phamnus*, etc., and predominates below 4,000 ft.

"The transition zone as bounded by the yellow pine extends from 4,000 ft. on the west slope over the range to 4,500 ft. on the east slope.

The desert Sonoran zone reaches an altitude of about 4,500 as marked by the upper limits of the desert palms, yuccas, mescal, and mesquites. The upper Sonoran on the west slope does not reach so high by at least 500 ft. as marked by the mesquites, yuccas, and mescal plants.

"On the south the Hanson Laguna Mountains are separated from the San Pedro Martir by a stretch of about fifty miles of broken hills and mesas, and at San Matias Pass by a short strip of desert. This intervening country ranges from 3,000 to 6,000 feet but lacks the yellow pine forests of the lagoon region. The piñon belt however is practically continuous except on the short desert strip at San Matias Pass."

After leaving El Alamo his first camp was at Ojos Negros, whence he passed on to Hanson Lagoon, about 5,000 feet altitude, then to Agua Escondido, Palomar, and Labozo, all in the same vicinity. Farther exploration was prevented by a snowstorm—it was now the 17th of November—which drove him out of the mountains and compelled his return to Ensenada on the coast. A large and valuable collection of mammals was obtained from the two ranges and the coast regions on either side, the only one in fact in any way approaching completeness, that has ever been procured in this country.

A map of the region traversed by Mr. Heller, with his routes indicated, accompanies this paper. A great portion of these mountain ranges has never been surveyed by the government, and such maps as are published are very incomplete, and none of the places visited by Mr. Heller is recorded. While not claiming for the present map any extreme accuracy, it nevertheless shows in detail the position of the various localities mentioned, where camps were made and the collection procured, and it is hoped it may be found serviceable to those investigating the fauna of this region. It was constructed from a sketch map made by Mr. Heller on his journey, with the assistance of the charts of northern Lower California published by the United States Government. The views given in the plates are from photographs taken by Mr. Heller in the places named.

ORDER UNGULATA.

FAM. CERVIDÆ.

ODOCOILEUS.

Odocoileus hemionus.

Odocoileus hemionus. (Rafin.) Am. Month. Mag., 1817, 1, p. 436, Elliot, Syn. N. Am. 1901, p. 42.

1 Specimen: San Quentin, Pacific coast.

This is a buck two or three years old, with the pure white tail and black tip. I cannot refer the specimen to any other species or

race, nor can I explain its appearance so far down the coast, when all the examples taken in the mountains are referable to *O. h. californicus*; unless it is confined to the coast in its dispersion. Of this I have no knowledge, for this specimen was the only deer taken in the lowlands. Although killed on the 4th of August, the horns are dark and hard, as if the velvet had been shed for some time, and the coat is that of autumn.

Odocoileus hemionus californicus.

Odocoileus hemionus californicus. (Caton.) Am. Nat., 1876, p. 464. Elliot, Syn. N. Am. Mamm., 1901, p. 43.

14 Specimens: 2♂ Hanson Lagoon, Hanson Laguna Mountains; 3, Santa Eulalia, 2♂, 1♀; 7, Vallecitos, 3♂, 4♀; 2, Parral, 1♂, 1♀; San Pedro Martir Mountains.

I refer all these specimens to this race. The majority are smaller than the average *O. hemionus*, and they have a strongly defined narrow line on the center of the tail above, which is the characteristic distinction of the form described by Judge Caton. None of the specimens are very old, though some of the bucks have fair-sized horns, the largest having five points and a spread of 20 inches, (510 millimeters). The horns while similar to those of the mule deer differ slightly in the manner in which the branching of the tines takes place. Two of the specimens from Santa Eulalia and two from Parral are in the full summer coat, a peculiar yellowish brown pelage that I have never seen in any of our Northern deer, and all the specimens have a conspicuous black line running from between the ears to the root of the tail. I do not know the form described by Lydekker (Deer of all Lands, p. 276) as *Mazama h. peninsulae* and do not see that he gives any characters to separate it from *O. h. californicus*, except its smaller size, and as he only had skins of females and young males to judge by, he may, very naturally, have been misled as to what might be the size of an adult male. The tail, with a "narrow line" connecting the black dorsal band with the black extremity, or in its absence replaced by "a broad ring of pale, straw-colored hair," would answer in the former for the *O. h. californicus*, and the latter possibly might do for *O. hemionus*. The fourteen specimens collected by Mr. Heller represent all sizes, but as proven by the skulls, this is entirely a matter of age, and one or two of the older bucks are large animals, equalling the average *O. hemionus*.

FAM. ANTILOCAPRIDÆ.

ANTILOCAPRA.

Antilocapra a. mexicana.

Antilocapra a. mexicana. Merr. Proc. Biol. Soc., Wash., 1901, p. 31.

1. ♂ Juv., San Felipe, Gulf of California.

"At rare intervals antelope have been observed at Rosarito"; tracks were seen at San Matias Spring; and the animals "occasionally come into the Cañon Esperanza for water from the near-lying desert." At San Quentin "a few occurred until recently west of the bay on the north end of the peninsula west of the town. This was apparently their northern range on the Pacific coast. It is not rare on the coast south of this place." At San Felipe Bay on the eastern coast "a few antelope inhabit the plains near the bay, but from the number of tracks seen there are probably less than a dozen. No herds of any size occur and they are usually seen singly or in bunches of three or four. The Indians report seeing as many as fifteen occasionally in a band."

FAM. BOVIDÆ.

OVIS.

Ovis cervina nelsoni (?)

Ovis cervina nelsoni. (Merr.) Proc. Biol. Soc., Wash., 1897, p. 217. Elliot, Syn. N. Am. Mamm., 1901, iii, p. 46.

13 Specimens: 11 ad. ♀, 1 ♂ juv., 1 ♀ juv. Mattoni, San Pedro Martir Mountains.

I refer all these specimens to the form described by Dr. Merriam from the Grape Vine Mountains, boundary line of Nevada and California, with some doubt. It is very difficult merely from a brief description to determine with any certainty whether two closely allied individuals from widely separated localities are of the same species or not, and as there are already too many named forms of mountain sheep, I have no desire to introduce another doubtful one, and for the present at all events, prefer to retain these specimens under the above name, until they can be compared with topotypes of the race named by Dr. Merriam, and a satisfactory decision be reached. The San Pedro Martir sheep is a small animal, with all the under parts, except a small white patch on the inguinal region and front part of fore and hind legs, blackish brown. White rump patch,

very large and not divided in the middle. Mr. Heller's notes on this species are as follows :

"Common about the cliffs, coming down occasionally to the water holes in the valley. Most of the sheep observed were either solitary or in small bands of three to a dozen. Only one adult ram was seen, all the others, about thirty, being either ewes or lambs. The largest bunch seen consisted of eleven, mostly ewes and a few young rams. The sheep as a rule inhabit the middle line of cliffs where they are safe from attack above and can watch the valley below for danger. Here about the middle line of cliffs they were observed and the greater number of tracks and dust wallows where they spend much of their time were seen. A few were seen on the level stretches of the mesas, and a considerable number of tracks, but these were made by those traveling from one line of cliffs to another. They are constantly on guard and very little of their time is given to browsing. Their usual method is to feed about some high cliffs or rocks taking an occasional mouthful of brush and then suddenly throwing up the head and gazing and listening for a long time before again taking food. They are not alarmed by scent, like deer or antelope, the direction of the wind apparently making no difference in hunting them. A small bunch of six were observed for a considerable time feeding. Their method seemed to be much the same as individuals, except that when danger was suspected by any member he would give a few quick leaps and all the flock would scamper to some high rock and face about in various directions, no two looking the same way. These manœuvres were often performed, perhaps once every fifteen minutes. Their chief enemy is the mountain lion, which hunts them on the cliffs, apparently never about watering places. Lion tracks were not rare about the sheep runs. They are extremely wary about coming down for water and take every precaution. Before leaving the cliffs to cross the valley to water they usually select some high ridge and descend along this, gazing constantly at the spring, usually halting ten or more minutes on every prominent rocky point. When within a hundred yards or less of the water a long careful search is made and a great deal of ear-work performed, the head being turned first to one side and then to the other. When they do at last satisfy themselves they make a bolt and drink quickly, stopping occasionally to listen and look for danger. If, however, they should be surprised at the water they do not flee at once, but gaze for some time at the intruder and then go a short way and take another look, and so on until at last they break into a steady run for the cliffs. At least thirty sheep were observed at the water and none

came before 9:30 A. M. or later than 2:30 P. M., most coming down between 12:00 M. and 1:00 P. M. This habit has probably been established to avoid lions, which are seldom about during the hottest part of the day. A few ewes were seen with two lambs, but the greater number had only one. Most of the young appeared about two months old. Their usual gait was a short gallop, seldom a walk or trot."

ORDER RODENTIA.

FAM. SCIURIDÆ.

SCIURUS.

Sciurus douglasi mearnsi.

Sciurus douglasi mearnsi. Towns. Proc. Biol. Soc., Wash., 1897, p. 146.

6 Specimens: 4 Vallecitos; 2 La Grulla, San Pedro Martir Mts., 9,000 feet elevation.

TAMIAS.

Tamias obscurus.

Tamias obscurus. Allen. Bull. Am. Mus. Nat. Hist., 1890, p. 70.

38 Examples: 1 Aguaji de las Fresas; 11 La Grulla; 13 St. Eulalia; 7 Vallecitos; 2 Rosarito; 1 Santa Rosa; San Pedro Martir Mountains; 3 Hanson Lagoon, Hanson Laguna Mountains.

Most of these specimens are in post-breeding pelage, and have a very different appearance from the type described by Dr. Allen, which is in winter pelage and resembles the three examples from Hanson Lagoon. The post-breeding pelage is very bright, the five dark dorsal streaks being very conspicuous, and of a bright chestnut color, the central one being black on lower half. The four gray dorsal streaks are also strongly accentuated and the flanks are tawny ochraceous or ochraceous rufus. Altogether it is a very different looking animal in the August and September dress from that in which it is clothed in May and November. This species is a dweller of high elevations, its lower limit being about the level of the "eastern edge of the Alamo plain."

CITELLUS.

Citellus leucurus.

Tamias leucurus. Merr. N. Am. Faun., No. 2, 1889, p. 20.
Spermophilus leucurus. Elliot, Syn. N. Am. Mamm., 1901, p. 86.

13 Specimens: 4 San Matias Spring; 2 Parral; 1 Trinidad, San Pedro Martir Mountains; 6 San Felipe, Gulf of California.

Mr. Heller states that this species reaches its "western limit at Trinidad, and is one of the forms that came in through the pass from the desert, and the piñon zone limits its vertical range." It was "common on the desert a mile or more from the base of the range," but at San Felipe Bay it was outnumbered by *C. tereticaudus* and was "seen in only a few places, usually about rough cañon walls."

Citellus leucurus peninsulæ.

Tamias leucurus peninsulæ. Allen. Bull. Am. Mus. Nat. Hist., 1893, p. 197.

13 Examples: 1 El Alamo, 2 Agua Escondido, San Pedro Martir Mts.; 10 San Quentin, Pacific coast.

This race would seem to be more a dweller of the lowlands than of the mountains, and is not found east of the San Pedro Martir range. At El Alamo Mr. Heller states that "several were seen in the more sterile portions. They apparently do not hibernate anywhere in their range as some were seen the latter part of November about the northern part of this chain, which is probably their upper limit. At San Quentin it was abundant about the creek-beds and hills."

Citellus tereticaudus.

Spermophilus tereticaudus. Baird. N. Am. Mamm., 1857, p. 315. Elliot, Syn. N. Am. Mamm., 1901, p. 98.

18 Specimens. San Felipe Bay, Gulf of California.

Mr. Heller says that this species "was very common about the bay. Their burrows were usually placed in the shelter of thorny bushes. They were evidently just assuming their summer pelage during the first part of April as two pelages were secured among the specimens taken. It has a peculiar mellow whistle. It was seen in San Matias Pass on the Pacific slope, not far from Trinidad, but in that region it was much less common than *S. leucurus*, which prefers the higher parts of the desert."

Citellus variegatus fisheri.

Spermophilus beecheyi fisheri. Merr. Proc. Biol. Soc., Wash., 1893, p. 133.

Spermophilus grammurus fisheri. Elliot, Syn. N. A. Mamm., 1901, p. 88.

31 Specimens: 1 Trinidad, 1 Las Eucinas, 1 El Alamo, 2 San Matias Springs, 1 Vallecitos, 3 La Grulla, 3 San Antonio, 6 Santa Eulalia, 1 Mattoni, 7 Parral, San Pedro Martir Mountains; 3 San Quentin, Pacific coast; 2 Hanson Lagoon, Hanson Laguna Mountains.

All these agree with the typical style of this race, except the El

Alamo example, two from La Grulla, and two from Hanson Lagoon, which have hoary tails like those of *C. v. douglasi*, but as the others—some from La Grulla, collected at the same time—have the yellowish brown tail similar to that of *S. v. beecheyi*, it is probably either an individual peculiarity or else one indicating age. Whatever may be the cause, it renders these particular specimens very conspicuous when compared with the others of the series. This spermophile was not uncommon in the localities in which it was found, living among the rocks and following the live-oak zone south.

FAM. MURIDÆ.

ONYCHOMYS.

Onychomys macrotis.

Onychomys macrotis. Elliot. Pub. Field Columb. Mus., 1903, p. 155 Zoölogy.

4 Specimens: 1 Trinidad, 1 El Alamo, 1 head of San Antonio River, San Pedro Martir Mountains; 1 San Quentin, Pacific coast.

This genus was apparently very poorly represented throughout the region traversed by Mr. Heller, as the four examples mentioned above were the only ones obtained. It is a pale species with large ears and long tail for an *Onychomys*, and has nothing in common with *O. ramona*, its nearest geographical relative from San Bernardino Valley, southern California. I believe the present specimens are the only ones recorded as having been taken in Lower California, although several forms are supposed to inhabit different portions of the peninsula.

PEROMYSCUS.

Peromyscus thurberi.

Peromyscus thurberi. Allen. Bull. Am. Mus. Nat. Hist., 1895, p. 193.

Sitomys Americanus medius. Mearns. Proc. U. S. Nat. Mus., 1895, p. 446.

72 Specimens: 14 Ensenada, 2 El Alamo, 1 Salado River Cañon, 1 Las Eucinas, 3 Trinidad, 5 head of San Antonio River, 1 San Matias Springs, 2 San Felipe, 2 Aguaje de las Fresas, 6 Vallecitos, 6 La Grulla, 3 Santa Rosa, 14 Santa Eulalia, 2 Juncalito, 6 Rosarito, San Pedro Martir Mountains; 4 San Quentin, Pacific coast.

This species obtained by Mr. Thurber and described by Dr. Allen is but little known to naturalists by specimens from Lower California, as it was supposed to be restricted to the higher ranges of the

San Pedro Martir Mountains. The present series demonstrates completely that this is far from being a fact, and that the species is not only met with on both the east and west coasts—San Felipe and Ensenada to San Quentin, from which localities examples were procured—but that its range extends also into southern California at least north to the Colorado Desert, and the reason it was not recognized on the coast and in southern California was that the specimens from these localities had been described under another name, *P. t. medius*, Mearns.

That this form is identical with *P. thurberi* is established by these Lower California examples. I have received for comparison with my large series of *thurberi*, through the kindness of G. S. Miller, Jr., Ass. Curator of Mammals, U. S. Nat. Museum, eighteen specimens of so-called *P. t. medius* from Rosa Cañon, San Diego Co., California, belonging to the collection of the National Museum, and six of the same from the New York Museum (2 from Sanos Cedros, Calif., 2 from Jacumba, Calif., and two from the Nashaguerro Valley, Lower California), the latter being topotypes of *medius*. In this (Field) Museum we have eleven specimens of *medius*, 2 from San Juan, Calif., 1 from Cuyamaco, Calif., 1 from Jamul, Calif., and 7 from San Antonio, California; 35 specimens in all of so-called *medius*, not a large series, but sufficient to demonstrate the value of its claims to a distinctive rank, if it possessed any. After a very careful examination of these and my series of 77 specimens of *thurberi*, (for in addition to those in Mr. Heller's collection there are five others in the museum, two of which are topotypes collected by Thurber), I do not find a single character either in color of pelage or in the skull to separate *medius* from *thurberi*. Dr. Mearns says that *medius* is a coast form, west of the coast range. There are before me 14 examples from Ensenada on the coast which are identically the same as *thurberi* from localities in the high mountains, and these resemble precisely topotypes of *medius* from the Nashaguerro Valley. Also topotypes of *thurberi* from the San Pedro Martir Mountains agree in every way with specimens of *medius* from southern California. The mountain specimens, those from the coast and also those from the plains in both the paler or darker pelage, can equally be matched one with the other irrespective of locality, and it is a hopeless task to find anything by which they can be separated. As the name *thurberi* has years priority over *medius*, it will be the one by which this species will be known, and it has a wide range from southern California as far north certainly as the Colorado Desert, south into Lower California, possibly to San Quentin on the coast and perhaps farther,

and throughout the San Pedro Martir Mountains up to at least six thousand feet elevation, and thence to the east coast, as the specimens were taken, as will be noticed, at San Felipe bordering the Gulf of California. The four specimens from San Quentin have been referred to *P. thurberi*, but with some hesitation.

Peromyscus hemionotis.

Peromyscus hemionotis. Elliot, Pub. Field Columb. Mus., 1903,

iii, p. 157, Zoölogy.

2 Specimens from the Rosarito Divide, San Pedro Martir Mts.

Peromyscus gaurus.

Peromyscus gaurus. Elliot, Pub. Field Columb. Mus., 1903, iii, p. 157, Zoölogy.

6 Examples from San Antonio, San Pedro Martir Mts.

Mr. Heller says this mouse was common about the borders of the stream, but only six were secured.

Peromyscus homochroia.

Peromyscus homochroia. Elliot, Pub. Field Columb. Mus., 1903, iii, p. 158, Zoölogy.

21 Specimens from San Quentin.

Mr. Heller, referring to this species, as I believe, says it was common about the San Simon Cañon.

Peromyscus oresterus.

Peromyscus oresterus. Elliot, Pub. Field Columb. Mus., 1903, iii, p. 159, Zoölogy.

15 Examples Hanson Lagoon, Hanson Laguna Mountains.

Peromyscus fraterculus.

Peromyscus fraterculus. Miller, Am. Nat., 1892, p. 261. Elliot, Syn. N. Am. Mamm., 1901, p. 136.

34 Specimens: 5 Ensenada, 2 Las Eucinas, 8 Trinidad, 5 head of San Antonio River, 7 San Antonio, 3 Rosarito, 4 San Quentin.

This species was quite abundant wherever met with.

Peromyscus martirensis.

Peromyscus martirensis. Allen, Bull. Am. Mus. Nat. Hist., 1893, p. 187.

73 Examples: 2 San Matias Spring, 2 Piñon, 9 Aguaje de las Fresas, 8 Vallecitos, 7 La Grulla, 7 Santa Rosa, 9 Santa Eulalia, San Pedro Martir Mountains; 1 Calobozo, 6 Palomar, 4 Agua Escondido, 18 Hanson Lagoon, Hanson Laguna Mountains.

Evidently an abundant species in the higher parts of the mountains.

“Common about Aguaje de las Fresas, at 6,000 feet; secured also at Piñon at 5,000 feet, and at La Grulla at 8,000 feet. A single one taken at Vallecitos at 9,000 feet, which attitude is evidently its upper limit; not found below 5,000 feet.”

Peromyscus eremicus.

Peromyscus eremicus. Baird, Mamm. N. Am., 1857, p. 497.
Elliot, Syn. N. Am. Mamm., 1901, p. 136.

42 Specimens: 3 Trinidad, 9 San Matias Spring, 12 Cañon Esperanza, 1 head San Antonio River, 6 Parral, 5 Mattoni, 5 Rosarito, San Pedro Martir Mts.; 1 Palomar, Hanson Laguna Mountains.

Peromyscus insignis.

Peromyscus insignis. Rhoads, Proc. Acad. Nat. Scien., Phil., 1895, p. 33. Elliot, Syn. N. Am. Mamm., 1901, p. 138.

18 Specimens: 2 Ensenada, 1 Trinidad, 8 Las Eucinas, 1 Rosarito, 1 Rosarito Divide, San Pedro Martir Mts.; 5 San Quentin, Pacific coast.

RHITHRODONTOMYS.

Rhithrodontomys peninsulæ.

Rhithrodontomys peninsulæ. Elliot, Field Columb. Mus., 1903, iii, p. 164, Zoölogy.

15 Specimens from San Quentin, Lower California.

“Common near the coast in damp meadows, but disappears a few miles inland.”

Rhithrodontomys l. pallidus.

Rhithrodontomys l. pallidus. Rhoads, Am. Nat., 1893, p. 835.
Elliot, Syn. N. Am. Mamm., 1901, p. 152.

2 Examples: 1 Las Eucinas, 1 Trinidad, San Pedro Martir Mts.
Evidently rare, as only two could be obtained. “The one at Las Eucinas was taken in the bed of a creek.”

NEOTOMA.

Neotoma intermedia.

Neotoma intermedia. Rhoads, Am. Nat., XXVII., 1894, p. 69.
Elliot, Syn. N. Am. Mamm., 1901, p. 161.

65 Specimens: 4 Ensenada, 1 El Alamo, 2 Agua San Matias, 1 Aguaje de las Fresas, 8 Vallecitos, 3 La Grulla, 5 San Antonio, 1 Santa Rosa, 11 St. Eulalia, 4 head of San Antonio River, 7 Parral(?),

2 Rosarito Divide, 5 Rosarito, 1 Agua Escondido, 4 San Quentin, San Pedro Martir Mountains; 2 Palomar, 3 Hanson Lagoon, 1 Agua Escondido, Hanson Laguna Mountains.

This series, including various ages and colors of pelage, I refer to *N. intermedia*. The color varies greatly among individuals, even of the same locality, from the pale brownish gray and black of the typical style, to a reddish hue, these last being old individuals. Reddish specimens were obtained at different localities such as Vallecitos, St. Eulalia, Rosarito, and Rosarito Divide, but the great majority of the examples are pale brownish gray, some indeed a light buff. The color of the under parts varies greatly even among specimens from the same locality, exhibiting the white chin and breast with remainder buff, or grayish buff, to nearly all buff or all grayish white with the plumbeous under fur showing through. This difference of color in probably most cases is due to age, but individuals of apparently the same age are not alike in color though inhabiting the same locality. And yet it may not be supposed that more than one species is represented in the series for it is not possible to indicate any line of separation among them either in color or cranial characters. Even in the old adult reddish specimens, one from Rosarito is typical in color on the under parts, with white chin and breast, rest bright buff; while another from Rosarito Divide, at no great distance away, is white beneath with only a faint tinge of buff on abdominal region. Another from Vallecitos is tinged with buff on a central line from breast to anal region the rest being grayish white; and one from St. Eulalia has a pale buff line in the center of under parts, the rest being plumbeous tinged with buff. Here therefore are four specimens from near-by localities, the color of their upper parts closely resembling each other, but beneath entirely different. They were taken from July to October, the two in August most nearly resembling each other in color of under parts, and the July and October specimens being nearer alike. It would seem therefore that little or no reliance can be placed upon the color of the under parts as a character for even a racial separation, in this series at all events whatever it may be in other forms, and notwithstanding the differences observable, to refer them all to one race seems the only way to treat them. The ears are generally longer than typical *intermedia*, ranging from 28-34, and hind foot from 30-36, but the total length and that of the tail will average as in *intermedia*. San Matias Spring is evidently the eastern limit of this species, for a few miles away on the edge of the desert the next race is found.

The specimens from Parral are assigned to *intermedia*, with great

hesitation, for while some are exactly like that species others resemble very closely *N. felipensis*. It would not seem probable that the latter form would range in the mountains so high above the desert, nor that the two would be present in the same locality and remain distinct. For the present I have left them under *intermedia*.

Neotoma bella felipensis, subsp. nov.

20 Specimens: 16 San Felipe, Gulf of California; 4 Palomar, Hanson Laguna Mountains.

Type locality. San Felipe, Gulf of California, Lower California.

Genl. Char. Largest of the pale colored desert rats; nearest to *N. bella*; feet and ears larger, tail longer. Skull with shorter and broader nasals, shorter pterygoid fossa, wider basioccipital and basisphenoid; bullæ much smaller; brain case much narrower posteriorly.

Color. Similar to *N. bella*, cream-buff lined with black on the upper parts, sides pale cream color; lips, hands, feet, lower portion of sides and under parts pure white; basal part of hairs on side and under parts plumbeous, except on chin, center of breast, and a line down the center of abdomen to anal region which has the hairs white to the roots; tail dusky above, whitish beneath; ears pale brown.

Measurements. Total length, type, 335; tail vertebræ, 158; hind foot, 34; ear, 34. Skull: occipital nasal length, 41; Hensel, 34; zygomatic breadth, 21; interorbital constriction, 5; width of brain case at root of zygomata, 18; posterior width, 14; palatal arch to alveoli of incisors, 19; postpalatal length, 15; median length of nasals, 15; posterior width of nasals, 2.5; anterior width of nasals, 4.5; palatal arch to hamular process of pterygoids, 7; width of basioccipital anteriorly, 8; width of basisphenoid at anterior point of bullæ, 4; length of upper molar series, 7; length of mandible, angle to alveolus of the incisor above, 23; height at condyle, 11; at coronoid process 12.5; length of lower molar series, 8.

In general appearance there is not much difference in color between the present form and *N. bella* from Palm Springs, southern California. A series of topotypes of *N. bella* are before me and by color alone it would be difficult to separate the Lower California specimens from them, but the latter are generally larger in adult animals, with longer ears, hind feet and tail, and the difference in the proportion of the skull seems to warrant their separation. From *N. desertorum* (two specimens of which, topotypes, were kindly loaned to me by Dr. A. K. Fisher, Acting Chief of the Biological Survey, Washington, together with a skull of *N. d. sola*), the San Felipe

specimens differ in larger size, lighter colored tail and ears, and much larger skulls; while the skull of *N. d. sola* is smaller generally, as would be naturally expected from the difference of the body measurements. The four specimens from Palomar, Hanson Laguna Mountains, are much more heavily lined with black than the San Felipe examples, and are consequently considerably darker, but I do not attach any importance to this, for there is considerable variation in the coloring of all these desert rats, some being much more richly colored than others, sometimes verging on orange-buff; others paler in the ground hue but lined heavily with black so as to make them conspicuous among the rest. I am unable to determine whether this difference of color is to be attributed to age or is an individual peculiarity. It may be seasonal as the Palomar specimens were taken in November and those from San Felipe in March and April.

MICROTUS.

Microtus californicus hyperythrus.

Microtus californicus hyperythrus (misprinted *huperuthrus*). Elliot, Pub. Field Columb. Mus., 1903, p. 161, Zoölogy.

31 Specimens: 6 Aguaje de las Fresas, 8 La Grulla, 2 Vallecitos, 3 San Antonio, San Pedro Martir Mountains; 12 San Quentin, Pacific coast.

This species at San Quentin "was found amid dense weeds and grass, and at San Antonio in the thick swamp. Generally distributed along streams from the base of the mountains to the highest meadows."

FAM. GEOMYIDÆ.

THOMOMYS.

Thomomys martirensis.

Thomomys martirensis. Allen, Bull. Am. Mus. Nat. Hist., 1898, p. 147.

29 Specimens: 2 Aguaje de las Fresas, 2 Vallecitos, 8 La Grulla. 4 Santa Eulalia, 1 Santa Rosa, 1 Mattoni, 5 Parral, San Pedro Martir Mountains; 6 Hanson Lagoon, Hanson Laguna Mountains,

45 examples of *Thomomys* were collected by Mr. Heller, and those from the higher portions of the San Pedro Martir range I have separated as belonging to Dr. Allen's species. As a rule they are larger than the coast animals, with longer nasals. In color they vary considerably, from an ochraceous buff to dark gray, the latter

being, as I believe, the adult pelage. Dr. Allen states (l. c.) that "the young show a marked suffusion of fulvous," but this is not perceptible in this series, and I think it possible that two forms may have been confounded, those from the foothills and coast and those from the mountains, for two species are apparently represented in the series of 45 specimens from this region. All the examples of *T. martirensis* have a grayish tinge, even among those with an ochraceous buff pelage, and none of them exhibit the dark hues of *T. fulvus*. The skulls vary considerably and it does not seem possible to give any cranial character by which the species can be certainly recognized, but, as I have already mentioned, the nasals are generally longer, and the average size of the individuals is larger. It is a pale colored form in youth, and dark gray in old age. At all events that is the impression these examples give, and no fulvous series is perceptible.

Thomomys* aphastrus, sp. nov.

16 Specimens: *Type locality.* San Tomas, Lower California, Mexico.

Genl. Char. About the size of *T. fulvus*, but darker and grayer. Nasals short, broad at anterior end, pterygoids almost touching the bullæ.

Color. Upper parts mixed broccoli brown and ochraceous, the slate of base of hairs occasionally showing and giving a grayish tint to the pelage; sides bright ochraceous buff; spot behind ear, nose and openings of pouches black; under parts ochraceous buff, plumbeous or slate of under fur showing; hands and feet grayish white; tail ochraceous buff above, yellowish beneath. (March.)

Another specimen from San Quentin, July, is lavender gray, darkest on dorsal region, with top of head ochraceous buff and black, and sides of head pinkish buff; sides of body buffy gray and under parts buff. This individual is beginning to change from gray to the darker pelage of winter.

Measurements. Total length, 222, tail vertebræ, 69; hind foot 29; ear, 7.5. Skull: occipito-nasal length, 38; Hensel, 35; interorbital constriction, 6; zygomatic width, 25; length of nasals, 12.5; anterior width of nasals, 4.5; palatal length, 23; length of upper molar series, 7.5; length of mandible, 22; length of lower molar series 7; height at coronoid process, 15.

This is a rather smaller species than *T. martirensis*, has much shorter nasals, and seems to be restricted to the lowlands and foot-

* $\psi\varphi\alpha\sigma\tau\sigma\varsigma$ —perplexing.

hills of the San Pedro Martir range. It is darker and grayer than *T. fulvus*; indeed, in certain seasons, as in the one described above, the pelage is a beautiful lavender-gray. The sixteen specimens exhibit a considerable diversity of coloring, a number being in process of change from the gray to the darker hue and two from San Antonio are very dark with a great many black hairs mixed with the lighter ones. With the exception of the short nasals the skulls do not show any particular characters not seen in those of *T. martirensis*, but the general hue of the pelage is much darker, and of quite a different shade from that usually seen in *T. fulvus* or *T. bottae*.

FAM. HETEROMYIDÆ.

SUBFAM. DIPIDOMYINÆ.

DIPODOMYS.

Dipodomys merriami simiolus.

Dipodomys merriami simiolus. Rhoads, Proc. Acad. Nat. Scien., Phil., 1893, p. 410, Elliot, Syn. N. Am. Mamm., 1901, p. 234.

10 Specimens: 1 Cañon Esperanza, San Pedro Martir Mts.; 9 San Felipe, Gulf of California.

At Cañon Esperanza this race was common on the sandy plains, but rare near the base of the mountains, "but at San Felipe Bay it was abundant, and the burrows were usually placed beneath bushes, and they were not found in colonies as frequently as was the next species."

Dipodomys deserti.

Dipodomys deserti. Steph., Am. Nat., 1887, p. 42, Pl. v., Elliot, Syn. N. Am. Mamm., 1901, p. 235.

11 Specimens, San Felipe, Gulf of California.

"This kangaroo rat," writes Mr. Heller, "was one of the most abundant mammals at San Felipe Bay. Its burrows were seen everywhere throughout the desert, where they were usually found in colonies of from three or four to a dozen or more."

PERODIPUS.

Perodipus agilis.

Perodipus agilis. Gambel, Proc. Acad. Nat. Scien. Phila., 1848, p. 77, Elliot, Syn. N. Am. Mamm., 1901, p. 236.

27 Examples: 8 Ensenada, 5 San Tomas, 1 Las Eucinas, 3 Trin-

idad, 2 Agua San Matias, 3 Head of San Antonio River, 4 Rosarito, 1 Rosarito Divide, San Pedro Martir Mts.

San Matias appears to be the eastern limit of this species in the mountains.

SUBFAM. HETEROMYINÆ.

PEROGNATHUS.

A. CHAETODIPUS

Perognathus baileyi rhydinorhis.

Perognathus baileyi rhydinorhis. Elliot, Pub. Field Columb. Mus., 1903, iii, p. 167.

14 Specimens: 10 San Quentin, Pacific coast; 3 Agua Joncolito, 1 Rosarito, West of San Pedro Martir Mts.

Perognathus penicillatus angustirostris.

Perognathus penicillatus angustirostris. Osgood, N. Am. Faun., No. 18, 1900, p. 47, Elliot, Syn. N. Am. Mamm., 1901, p. 252.

12 Specimens: 1 Buena Vista, 11 San Felipe, Gulf of California.

The type of this race came from Carriso Creek, Colorado Desert, California, and these Lower California examples are not typical, being paler and with a fulvous tinge on the upper parts. But the difference observable does not warrant any separation of individuals in the various localities. Mr. Heller only met with it in the two places mentioned above, both in desert regions on the east coast, where it associated with the next race, a gradation from one to the other of the two forms being noticeable.

Perognathus penicillatus arenarius.

Perognathus penicillatus arenarius. Merr., Proc. Cal. Acad. Scien., 1894, iv., p. 461.

21 Examples, San Felipe, Gulf of California.

These specimens are referred to *P. arenarius*, although certain differences in the cranial characters are observable. The unique type of *P. arenarius* was taken at Comondu, much to the south of San Felipe, and until more examples are obtained and comparison made with northern individuals it will not be possible to know if the determination of these San Felipe specimens is correct or not.

Perognathus helleri.

Perognathus helleri. Elliot, Pub. Field Columb. Mus., iii, 1903, p. 166.

19 Specimens, San Quentin, Gulf of California.

"The most abundant mammal about the bed of the San Simon River."

Perognathus fallax.

Perognathus fallax. Merr., N. Am. Faun., 1889, No. 1, p. 19, Pl. iii, fig. 14, Elliot, Syn. N. Am. Mamm., 1901, p. 254.

39 Specimens: 5 Ensenada, 1 Trinidad, 2 Agua San Matias, 15 San Antonio, 1 Mattoni, 1 head of San Antonio River, 1 Agua Joncolito, 11 Rosarito, 2 San Quentin.

Perognathus cneucus.

Perognathus cneucus (misprinted knekus). Elliot, Pub. Field Columb. Mus., iii, 1903, p. 169.

1 Specimen from Rosarito, west of San Pedro Martir Mts.

Perognathus femoralis.

Perognathus femoralis. Allen, Bull. Am. Mus. Nat. Hist., 1891, p. 281.

3 Specimens, Hanson Lagoon, Hanson Laguna Mts.

Perognathus femoralis mesopolius.

Perognathus femoralis mesopolius. Elliot, Field Columb. Mus., iii, 1903, p. 168.

13 Specimens: 2 Piñon; 5 Aguaje de Las Fresas, 4 Santa Rosa, 2 Santa Eulalia, San Pedro Martir Mts.

Perognathus spinatus.

Perognathus spinatus. Merr., N. Am. Faun., No. 1, 1889, p. 21. Elliot, Syn. N. Am. Mamm., 1901, p. 255.

40 Examples: 9 Agua San Matias, 7 Cañon Esperanza, 1 Cañon Diablo, 5 San Antonio, 7 Parral, 10 Mattoni, San Pedro Martir Mts.; 1 Palomar, Hanson Laguna Mts.

At Cañon Esperanza, San Matias Springs, and San Antonio this species was abundant. At the first of these localities Mr. Heller writes, "in March none were taken, but on my return I placed traps in the same situations where *Peromyscus* had been previously taken, but nothing save *Perognathus* was obtained. It would appear that they had migrated into the cañon since my departure or awoke from some sort of dormant state or hibernation."

FAM. LEPORIDÆ.

LEPUS.

A. SILVILAGUS.

Lepus auduboni.

Lepus auduboni. Baird, Mamm. N. Am., 1857, p. 608, pl. 58, fig. 2. Elliot, Syn. N. Am. Mamm., 1901, p. 283.

6 Specimens: 1 San Tomas, 5 El Alamo, San Pedro Martir Mts.

At San Tomas this species was rare, but common about the cactus thickets at El Alamo. It "evidently does not extend down the coast much farther south than San Tomas."

B. MICROLAGUS.

Lepus cinerascens.

Lepus cinerascens. Allen, Bull. Am. Mus. Nat. Hist., 1890, iii., p. 159. Elliot, Syn. N. Am. Mamm., 1901, p. 287.

18 Examples: 1 Trinidad, 1 Salado River Cañon, 1 St. Eulalia, 7 Rosarito, 8 San Quentin.

This species "was abundant in but few places. At San Quentin it inhabited the Pityba cactus thickets in the same kind of country frequented by *Neotoma intermedia*. No rabbit signs were seen above the distribution of the black chamiso; that is, not above 6,000 feet."

C. MACROTOLAGUS.

Lepus californicus.

Lepus californicus. Bachm, Jour. Acad. Nat. Scien., 1839, p. 86. Elliot, Syn. N. Am. Mamm., 1901, p. 291.

6 Specimens: 1 Trinidad, 2 Parral, San Pedro Martir Mts.; 3 San Quentin.

At San Quentin this hare "was abundant in cultivated fields and about creek-beds."

Lepus texensis deserticola.

Lepus texensis deserticola. Mearns, Proc. U. S. Nat. Mus., 1895, p. 564. Elliot, Syn. N. Am. Mamm., 1901, p. 291.

4 Specimens: 2 Cañon Esperanza, San Pedro Martir Mts.; 2 San Felipe, Gulf of California.

One of the San Felipe examples is a pale sandy gray and black, very different from the other three.

Lepus martirensis.

Lepus martirensis. Stowell, Proc. Calif. Acad. Scien., v., 1895, p. 50.

5 Specimens: 4 St. Eulalia, 1 Rosarito, San Pedro Martir Mts.

This species was said to occur about La Grulla, but was not taken there. It is, says Mr. Heller, "abundant below the pine belt, the lower part of which it enters and ranges to a height of 8,000 feet."

ORDER CARNIVORA.**FAM. FELIDÆ.****FELIS.*****Felis rufa californica.***

Lynx rufus californicus. Mearns, U. S. Nat. Mus., 1897, xx., p. 458.

Felis rufa californica. Elliot, Syn. N. Am. Mamm., 1901, p. 298.

2 Specimens: 1 ad., 1 juv., Hanson Lagoon. Hanson Laguna Mountains.

FAM. CANIDÆ.**CANIS.*****Canis mearnsi.***

Canis mearnsi. Merr., Proc. Biol. Soc. Wash., 1897, p. 30. Elliot, Syn. N. Am. Mamm., 1901, p. 303.

5 Examples: 2 El Alamo, San Pedro Martir Mountains; 2 Hanson Lagoon and 1 Calobozo, Hanson Laguna Mountains.

In my Synopsis of North American Mammals, p. 303, I remarked, concerning the described forms of coyote, that "It is difficult to distinguish these varieties of the coyote by any description, and still more so by the skins or skulls." There are seventeen specimens of coyotes in the collection procured by Mr. Heller, and any one who should attempt to allot each one to its respective species, unaided by either skins or skulls of *topotypes* of the described forms, would be deeply impressed by the force of the above statement. The distinctions made by Dr. Merriam in his paper on the coyotes (l. c.) are mainly comparative between the various forms recognized by him, and if one has not authenticated specimens of these, it is practically impossible to determine what species his examples represent. My friend, Dr. A. K. Fisher, acting chief of the Biological Survey, Washington, kindly forwarded to me specimens of *C. mearnsi*, *C. estor* and *C. peninsulae*, and by the aid of these I have

been able to determine in a fairly satisfactory manner, thirteen of my examples, five belonging, as I believe, to the present species. The specimen of *C. mearnsi* sent from Washington was procured at Colonia Garcia, State of Chihuahua, Mexico, and is by no means so highly colored as are those from Lower California, and the latter are darker on the back with the black of the dorsal region, in the majority of the specimens, extending to the occiput, and exhibiting a sufficient difference probably for those fond of fine distinctions to constitute a separate race. This wolf, in its rich coloring, is deserving of the praise Dr. Merriam gives it as the "handsomest of the coyotes." This species was abundant throughout the Alamo plain and in the mountains of Hanson Laguna.

Canis estor.

Canis estor. Merr., Proc. Biol. Soc. Wash., 1897, p. 31. Elliot, Syn. N. Am. Mamm., 1901, p. 302.

8 Specimens: 2 Cañon Esperanza, San Pedro Martir Mountains; 4 San Felipe, Gulf of California; 2 San Quentin, Pacific coast.

All of these, with the exception of the San Quentin specimens, agree fairly well with the Washington example of *C. estor*, taken in Death Valley, California. The San Quentin skins are more darkly colored and have a greater amount of black on the upper parts, and the skulls are larger generally, but no doubt these are but individual variations, for it is probable these coyotes of the lowlands and the desert pass by way of the cañons in the San Pedro Martir Mountains from the east to the west coast, and vice versa. They were numerous in the various localities visited by Mr. Heller, and were very troublesome, stealing animals from the traps and otherwise interfering with the collecting, and to protect himself from loss of specimens Mr. Heller was obliged to try and catch the wolves first, and then turn his attention to the smaller mammals.

Canis clepticus,* Sp. nov.

4 Specimens: 1 Agua Escondido, 1 Santa Rosa, 1 Santa Eulalia, 1 Vallecitos, San Pedro Martir Mountains.

Type locality. Vallecitos, San Pedro Martir Mountains, 9,000 feet elevation.

Genl. Char. Summer pelage above reddish, size small. Skull short, broad, brain case and across post-orbital processes wide, the latter long; nasals rather short, narrow; rostrum narrow; pterygoid fossa broad, long; outline of bullæ on basioccipital not approach-

* *χλεπτηιχός*—thievish.

ing posteriorly; palate wide between molars; occipital crest prominent; teeth small, weak; tail short, bushy.

Color.—September. Nose cinnamon rufous, cheeks mixed gray and black; upper lip, chin and between jaws grizzled grayish white; top of head grizzled black gray and fulvous; back of ears, occiput, and back of neck deep buffy ochraceous, uniform; rest of upper parts tawny or tawny ochraceous, with numerous white-tipped hairs intermingled; lower part of throat white; sides of neck and collar beneath throat buff, in some places creamy buff; chest, abdomen and inner sides of thighs near body white; rest of under parts grizzled grayish buff, and black; shoulders pale buffy ochraceous; fore and hind legs rich fulvous, feet paler, whitish on toes at base of claws. Tail tawny ochraceous, white at base beneath; inner side and edge of ears white. New hairs of the winter pelage coming in black, with white tips. The August examples in greatly worn pelage are darker tawny, with a great many white-tipped, long blackish brown hairs intermingled with the rest.

Measurements, type, female.—Total lengths, 1030; tail vertebræ, 275; hind foot, 173; ear, 110. Skull: occipito-nasal length, 147 (163); total length, 169 (173); Hensel, 149 (153); zygomatic width, 94 (95); interorbital constriction, 29 (30.5); width of brain case above zygomata, 59 (60); across postorbital processes, 46 (46); length of nasals, median, 55 (60); lateral, 63 (67); width of rostrum above last premolar, 27 (25); palatal length, 81 (82); width of palate at posterior end of carnassial, 42 (40); between last molar, 29.5 (27); palatal arch to end of hamular process of pterygoid, 30 (31.5); width of basisphenoid at anterior margin of bullæ, 15 (15.5); width of basioccipital at posterior line of bullæ, 14 (15); length of upper carnassial, outer alveolar border, 10 (16); length from anterior edge of canine to posterior margin of last molar, alveolar border, 71 (75); alveolar length of upper molar series, 29.5 (33); postero-antero width of last molar, 5 (6); length, 9 (10.5); length of mandible, angle to alveolus of outer incisor, 121 (123); height at condyle, 24 (23.5); at coronoid process, 47 (50); alveolar length of lower carnassial, 17 (19); length of lower molar series, 36 (42); anterior margin of canine to posterior margin of last molar, alveolar border, 78 (83.5). The numbers in parentheses are the measurements of a skull of a male.

Three examples of this species are in the summer pelage in a much worn condition. The fur of the type, killed the 29th of September, is long and fresh, evidently the full autumn pelage, the dark hairs characteristic of the winter coat only beginning to appear at the base

of the fur. In this latter pelage it apparently would resemble the type of *C. peninsulae*. The specimen kindly loaned to me by Dr. Fisher, from the collection of the Biological Survey, was taken on April 20th, and is in the grizzled gray and black coat of winter, very much worn and the skin partly bare in places. For comparison, therefore, with my examples this skin is not of much assistance, but a glance at the skulls is sufficient to perceive the distinctness of the two forms. The skull of *C. clepticus* is short and broad, while that of *C. peninsulae* is comparatively long and narrow. The brain case of the new form is swollen and rounded, much broader than that of the Cape species, and the frontals at the postorbital processes are much broader; the rostrum is more slender; the basioccipital, basi-sphenoid, and palate posteriorly much wider; the pterygoid fossa longer, and the carnassial and other molars smaller. The zygomatic breadth also is much greater. Probably at the same season of the year the coats of the two species would have a general resemblance to each other, but the skulls would always indicate their distinctness. This species seems to be a dweller of the higher elevations of the San Pedro Martir range, as it was not met with in the foothills or on the plains, being replaced in those districts by the pale *C. estor*. It is a very handsome animal in full coat, and very reddish in midsummer.

VULPES.

Vulpes macrotis.

Vulpes macrotis. Merr., Proc. Biol. Soc. Wash., 1888, p. 135. Elliot, Syn. N. Am. Mamm., 1901, p. 306.

2 Specimens: Trinidad, San Pedro Martir Mountains.

This small fox appeared to be rare and restricted to the mountains; as Mr. Heller remarks; it "evidently does not occur on the desert," and none were seen in the country on the eastern side of the range.

UROCYON.

Urocyon c. californicus.

Urocyon c. californicus. Mearns, Proc. U. S. Nat. Mus., Wash., 1897, p. 459. Elliot, Syn. N. Am. Mamm., 1901, p. 308.

2 Examples: 1 ad, Hanson Lagoon, Hanson Laguna Mts.; 1 juv. Santa Eulalia, San Pedro Martir Mountains.

FAM. MUSTELIDÆ.

SPILOGALE.

Spilogale arizonæ martirensis.

Spilogale arizonæ martirensis. Elliot, Pub. Field Columb. Mus., iii., 1903, p. 12, Zoölogy.

2 Specimens: Vallecitos, San Pedro Martir Mountains.

Skunks were very scarce throughout the region, no *Mephitis* was captured or seen, not even the tracks observed, and the two *Spilogale* were the only specimens taken. The natives said the polecat also occurred at La Grulla, but no evidence of its presence was discovered at that place.

ORDER INSECTIVORA.

FAM. SORICIDÆ.

SOREX.

Sorex orinus.

Sorex orinus (misprinted oreinus). Elliot, Pub. Field Columb. Mus., 1903, iii., p. 172, Zoölogy.

4 Specimens: 1 Aguaje de Las Fresas, San Pedro Martir Mts.; 3 San Quentin, Pacific coast.

Of this species Mr. Heller says, it "evidently occurs about other streams (besides that at Aguaje de las Fresas) but of rare occurrence," and about San Quentin it was found "only near the coast in damp meadows." It is undoubtedly a scarce form in the region traversed, only four having been taken in a period of several months duration.

ORDER CHIROPTERA.

FAM. VESPERTILIONIDÆ.

MYOTIS.

Myotis* orinomus, Sp. nov.

Type locality, La Grulla, San Pedro Martir Mountains, 8,000 feet elevation.

Genl. Char., similar to *M. californicus*, but larger; color paler; ear larger; skull larger; brain case flatter, less elevated above rostrum;

**ορεινομος*—dwelling in the mountains.

interorbital constriction greater, rostrum longer; palate narrower; molars larger; coronoid process much higher above angle of mandible; tragus long, slender, pointed.

Color. Above, dark wood brown; beneath, very pale broccoli brown; ears, feet, and membranes black.

Measurements. Total length, 88; tail, 40; foot, 7; ear, 14; width of ear, 10; Coll. meas'ts: forearm, both bones broken; longest finger, 60; thumb and claw, 5; tragus, 7; (skin). Skull: occipito-nasal length, 13; Hensel, 11; zygomatic width, 8.5; width of brain case, 7; height of brain case at bullæ, 4.5; length of rostrum, 6; palatal length, 6; width across middle molars from outer edge, 5; length of upper molar series, 3.5; length of mandible, 9.5; height at coronoid process from angle, 4.5; length of lower molar series, 3.5.

This bat is somewhat similar to *M. californicus*, but is larger in all its measurements, and of a paler color both on upper and under parts. The skull is quite different in shape and larger than that of the species compared. Only three specimens were obtained, two at La Grulla and one at St. Eulalia, high elevations amid the San Pedro Martir Mountains.

Myotis milleri.

Myotis milleri. Elliot, Pub. Field Columb. Mus., 1903, iii., p. 172, Zoölogy.

2 Specimens: La Grulla.

PIPISTRELLUS.

Pipistrellus hesperus.

Pipistrellus hesperus. (H. Allen.) Mon. N. Am. Bats, 1861, p. 43. Elliot, Syn. N. Am. Mamm., 1901, p. 409.

13 Specimens: 3 San Felipe, Gulf of California; 3 Santa Eulalia, 2 Santa Rosa, 2 Rosarito, 3 Parral, San Pedro Martir Mountains.

This was apparently the most abundant species of bat met with, and was generally distributed throughout the range.

VESPERTILIO.

Vespertilio fuscus bernardinus.

Vespertilio fuscus bernardinus. (Rhoads.) Proc. Acad. Nat. Scien., Phil., 1901, p. 619.

13 Examples: 1 La Grulla, 12 Parral, San Pedro Martir Mountains.

This is apparently the pale form of *V. fuscus*, separated by Mr. Rhoads, l. c. The only place it was numerous was at Parral. The

single specimen from La Grulla, although referred to this race, is much darker, quite a different shade of brown. Doubtless there is much variation in the colors of this race.

LASIURUS.

Lasiurus borealis teliotis.

Lasiurus borealis teliotis. (H. Allen.) Proc. Am. Phil. Soc., 1891, xxix., p. 1. Elliot, Syn. N. Am. Mamm., 1901, p. 411.

1 Specimen: San Tomas, Pacific coast.

Lasiurus cinereus.

Lasiurus cinereus. (Beauvois.) Cat. Peale's Mus. Phil., 1796, p. 14. Elliot, Syn. N. Am. Mamm., 1901, p. 411.

1 Specimen: San Antonio.

NYCTINOMUS.

Nyctinomus mexicanus.

Nyctinomus mexicanus. Sauss, Rev. Zoöl., 1860, p. 283.

Nyctinomus mohavensis. Merr., N. Am. Faun., No. 2, 1889, p. 25.

Nyctinomus brasiliensis. Elliot, Syn. N. Am. Mamm., 1901, p. 417.

2 Specimens (1 alcoholic): La Grulla, San Pedro Martir Mountains.

I can perceive no difference whatever between this species and *mohavensis*, Merr.

The following species have been seen or obtained in the region traversed by Mr. Heller, but are not represented in the present collection.

ORDER CARNIVORA.

FAM. FELIDÆ.

FELIS.

Felis concolor oregonensis?

Felis concolor oregonensis? Rafin, Atl. Jour. 1832, i., p. 62. Elliot, Syn. N. Am. Mamm., 1901, p. 294.

Some form of mountain lion is found in various parts of the mountains both at high elevations and among the foothills on the western side. At San Antonio they were reported "tolerably common and continually commit depredations on the young stock and cattle." In the mountains "old tracks were seen at every locality visited,

much more common about the base, both on the east and west slopes." "Occasionally seen on the deer ranges in the foothills" back of San Quentin. It may be that this puma is the same as that found in northern Mexico (Chihuahua), (*F. c. aztecus*, Merr.) of which form this museum has five topotypes and which I am unable to separate from the animal of the northwest coast of the United States.

FAM. PROCYONIDÆ.

PROCYON.

Procyon lotor hernandez?

Procyon lotor hernandez? Wagl., Isis, 1831, p. 514. Elliot, Syn. N. Am. Mamm., 1901, p. 317.

Tracks of a coon were frequently seen, especially about the water holes and banks of streams, and on "both slopes of the mountains almost to the summits, as the animals cross the range to the edge of the desert." It is most probably the species found in Southern California and Mexico.

MEPHITIS.

Mephitis holzneri?

Mephitis holzneri? Mearns, Proc. U. S. Nat. Mus., xx., 1897, p. 461.

A species of this genus was reported to occur in the mountains, but none were met with, and no tracks were seen.

FAM. MUSTELIDÆ.

PUTORIUS.

Putorius?

A weasel was "said to have been seen by a rancher. Its occurrence is rather doubtful as the natives are entirely unacquainted with the animal. Even at Ensenada, which is a much more favorable region, no one knew of them and it is probable that it does not cross the line. At San Diego an experienced collector said that they were very rare."

LATAX.

Latax lutris.

Latax lutris. Linn., Syst. Nat., 1, 1766, p. 66. Elliot, Syn. N. Am. Mamm., 1901, p. 354.

"Formerly found about the kelp off the coast near San Quentin, but now very rare. It is occasionally taken in the kelp beds about Punta Banda near the mouth of Santa Tomas River."

ORDER PINNIPEDIA.

ZALOPHUS.

Zalophus californianus.

Zalophus californianus. Less., Dict. Class. Hist. Nat., 1828, xiii., p. 420. Elliot, Syn. N. Am. Mamm., 1901, p. 356.

“Common on the rocks about Punta Banda and the coast generally. Rookeries are found on San Martin Island.”

Phoca geronimensis.

Phoca geronimensis. Allen, Bull. Am. Mus. Nat. Hist., 1902, p. 495.

“Abundant in Todos Santos Bay and the Bay of San Quentin.”

ORDER INSECTIVORA.

FAM. TALPIDÆ.

SCAPANUS.

Scapanus anthonyi.

Scapanus anthonyi. Allen, Bull. Am. Mus. Nat. Hist., 1893, p. 200.

“Surface runways seen at nearly every locality visited, but no mounds showing the location of the subterranean passages were visible. Taken occasionally by the Mexicans by watching the surface runways.”

ORDER CHIROPTERA.

MYOTIS.

Myotis evotis.

Myotis evotis. H. Allen, Mon. N. Am. Bats, 1864, p. 48. Elliot, Syn. N. Am. Mamm., 1901, p. 406.

Stated by J. A. Allen (Bull. Am. Mus. Nat. Hist., 1893, p. 202) to occur in the San Pedro Martir Mountains, no locality given, at altitudes of 7,000 to 8,200 feet.

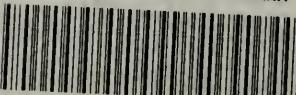
Myotis yumanensis.

Myotis yumanensis. H. Allen, Mon. N. Am. Bats, 1864, p. 58. Elliot, Syn. N. Am. Mamm., 1901, p. 483.

21 Specimens of a small bat are referred by J. A. Allen (l. c.) to this species under the name of *Vespertilio nitidus*, taken in the San Pedro Martir Mountains, no locality given, at heights varying from 7,000 to 8,500 feet.



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